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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Device for Wrapping a Packaging Unit

(72) Paulitschke, Werner - Germany (Federal Republic of) ;

(73) Deutsche Rockwool Mineralwoll-GmbH - Germany (Federal Republic of) ;

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(57) 14 Claims

Notice: This application is as filed and may therefore contain an incomplete specification.

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ABSTRACT

A device for wrapping a bulky package which consists of mineral wool sheets or a roll of mineral. The device has a conveyor for moving the package unit. A roll of film is disposed a distance above the conveyor and a roll of film is disposed below the conveyor. A welding and a stricker bar are movable towards one another for clamping end portions of a wrapping of the films and welding them together. A cutting device is provided for cutting through a transversely running weld formed by the welding bar and also cutting the ends of the wrapping and ends of the films. Films are welded together at their ends to form a vertical curtain against which the package can be displaced to pull the film from the rolls to form the wrapping. The device is characterized in that the welding bar and the stricker bar, seen in the direction of conveyance of the package, are of a predetermined width and the welding bar is provided with at least two heating zones spaced at a distance from another whereby a carrying strap is formed on the periphery of the wrapping. The cutting device has additional tools for making at least one grip opening at a convenience grip area of the carrying strap. The welding bar has at least one additional heating zone close to an edge of the grip openings. A package of bulky mineral wool sheets or a bulky roll of mineral wool having wrapping which is open at opposed ends and which consists of two shrinkable plastic film pieces of which the ends are joined together by two welds. The package is characterized in that an outwardly extending carrying strap is formed in a flap extending outwardly from a weld. The carrying strap is formed from extended ends of the plastic film pieces and has at least one grip opening which is surrounded by a weld and disposed at a convenient location along the strap.

Device for wrapping packages.

The invention relates to a device for the wrapping packages, such as mineral wool sheets or rolls and comprising a conveyor on which the package is displaced, a roll of film positioned at a distance above and below the conveyor device, a welding bar and a striker bar, which can be brought towards one another in such a way that between them, the ends of the wrapping can be clamped and welded together, and wherein a cutting device for cutting the formed transverse weld in a manner such that ends of the wrapping and the ends of the films which can be separated while welded together.

Devices of the above-mentioned type are known in practice. They operate in such a way that package, for example, packages of mineral wool sheets stacked on top of each other, are supplied in rows, one after another, by means of a conveying device. The ends of the films, which can be pulled or unrolled from an upper and lower roll of film, are joined together by a weld so as to form a curtain. The package unit in question is then moved against this curtain so that sections of film are pulled from the upper as well as the lower roll of film. The package keeps moving and takes along the film until it has moved over a striker bar. The package, for example, the package of mineral wool sheets, then stops at a distance of about 10 to 20 cm past the striker bar. At this point, the package is wrapped on three sides, approximately in a U-shape, by the plastic film. In this position, the welding bar moves against the striker bar and pulls an additional section of the plastic film from the adjacent roll of film. In the striking position, an electric heater, located in the welding bar, is heated so that a weld, running transversely to the direction of conveyance, is formed. After rapid cooling of the weld, the latter is cut in the middle in such a way that in the first place, the package

unit remains completely wrapped in the plastic film and in the second place, the ends of the sections of film, on both sides, unrolled from the rolls of film, are welded together so that a curtain is again formed. The welding bar then returns to the starting position and the wrapping operation can be repeated. Subsequent to this operation, the wrapped package unit is led into a shrinkage tunnel, in which the plastic film is heated in such a way and upon cooling again, shrunk in such a way, that it fits tightly about the entire circumference of the package. The film wrapping of the ready packed package unit then has two welds, running over the entire width. A shrink film, actually of a polyethylene material, is used as the plastic film.

Such package units are generally extremely bulky. As the plastic film is very slippery, the packages are very difficult to handle. For storage, however, they have to be stacked mostly by hand in large quantities, transferred to trucks, unloaded again at the dealer or at the construction site and finally transported again for use. During these operations, the bulky package units have to be seized with widely extended arms by the workmen in question, lifted and carried further, in which case they often slip due to the slippery plastic film and fall to the floor so that the plastic film can be damaged.

In contrast, a feature of the present invention is to provide a device capable of producing a wrapping wherein the package units are easy to handle.

The above mentioned disadvantages are solved in that the welding bar and the striker bar, seen in the direction of conveyance of the package unit, are designed so wide and the welding bar is provided with at least two heating zones, spaced at a distance from one another, that a carrying strap is formed on the periphery of the wrapping.

The present invention is further characterized by a package of mineral wool sheets or rolls with a wrapping, which consists of a shrinkable plastic film and of which the ends are joined together by a weld which forms a carrying strap defined by a flange or flap extending outwards.

Accordingly, from a broad aspect, the present invention provides a device for wrapping a package of mineral wool sheets or rolls. The device has a conveyor for conveying the package. A roll of film is spaced a distance above the conveyor and a further roll of film is disposed below the conveyor. The welding bar and a stricker bar are movable against one another for clamping ends of films between them and forming a wrapping. A cutting device is provided for cutting through a transversely running weld at the ends of the films of the wrapping. The films are pulled from the rolls of films by the moving package. The device is characterized in that the welding bar and the stricker bar, seen in a direction of conveyance of the package, are of a predetermined width and the welding bar is provided with at least two heating zones which are spaced at a distance from one another so that on the periphery of the wrapping, a carrying strap is formed.

According to a still further broad aspect of the present invention, there is provided a package of mineral wool sheets or rolls having a wrapping which consist of a shrinkable plastic film and of which the ends of the film are joined together with a weld. The package is characterized in that the weld defines an outwardly extending flange defining a carrying strap.

A preferred embodiment of the present invention is

described with reference to the accompanying drawings:

Fig. 1 is a side view of a device at a starting operating position;

Fig. 2 is a side view of the device according to Fig. 1, but in an intermediate operating position;

Fig. 3 is a side view of the device according to Fig. 1 or 2 in an operating position during the welding operation;

Fig. 4 is a side view corresponding to Fig. 3, but showing a modification of the device;

Fig. 5 is a side view of the device according to Fig. 4 in an operating position after completion of the welding operation;

Fig. 6 is a top view on a wrapped package;

Fig. 7 is an enlarged partial cross-section view of the carrying strap, and

Fig. 8 shows enlarged partial cross-section view along cross-section line VIII-VIII of Fig. 6.

For the exemplified embodiments described herein, the following, the same designations were used in each case for components which are the same or operate in the same way, so that the description relating to these apply to the different illustrated embodiments. In the embodiment, according to Figs. 1 to 3, two conveying devices 1, 2 in the form of roller conveyors are provided. Instead of the roller conveyors, other suitable conveying devices, for example continuous conveyor belts, can also be used. Between the two conveying devices, there is a stationary striker bar 13, of which the upper striking surface is at the level of the upper conveying surface of the conveying devices 1, 2. Vertically, at a distance above the roller conveyor 1, a roll of film 3 is provided. Another roll of film 4 is likewise installed rotatably below the roller conveyor 1. From the upper roll of film 3, a film 5 can be

pulled and from the lower roll of film 4, another film 6, in which case the rolls of film always turn in the direction of the arrows 20 and 21. The ends of the two sheets of film 5, 6 are joined together by a weld 7, which runs at right angles to the plane of Fig. 1 and extends across the entire width of the strip of film. Close to the rolls of film, there are guide rolls 8 and 9 which are arranged in such a way that the lower sheet of film 6 passes through a gap between the conveying device 1 and the striker bar 13.

In the starting operating position according to Fig. 1, there is on the roller conveyor 1, a package unit 14, which in this exemplified embodiment consists of a stack or a package of mineral wool sheets 15 stacked one on top of another. Further, there is a welding bar 10 which, by means of a rod 11, herein shown in a simplified form, can be moved up and down in the direction of the arrow 12. The travel of the welding bar 10 is also greater than the height of the package unit 14.

In the operating position according to Fig. 1, the welding bar is in its upper position. If now the package 14 or the stack of sheets is moved in the direction of arrow 16, into the operating position according to Fig. 2, a section of the sheets of film 5, 6 is pulled from the two rolls of film 3, 4 so that in this operating position, the bottom and the front end of the package, in the direction of conveying, are first wrapped by the plastic film. In the further operation, the welding bar 10 is moved over the travel distance down to the striker bar 13, resulting in the operating position according to Fig. 3. During the travel of the welding bar, the strip of film 5 is lifted from the guide roll 17. The package unit is wrapped on the entire circumference by the plastic film.

As illustrated in Figs. 1 to 3 and also Figs. 4 and 5, there is shown another embodiment and wherein, the welding bar 10 and the striker bar 13, seen in the direction of conveyance 16 of the package 14, are designed very wide. The welding bar 10 is provided with at least two heating zones 18, 19, spaced at a distance from one another. During the welding operation, a carrying strap 23 is formed on the peripheral edge of the wrapping 26. Advantageously, the heating zone 18 can also be of a double design so that two welds, spaced closely next to one another, are formed, between which a cutting operation can be effected. According to Fig. 3, the section of film of the wrapping 26, on the rear end, runs at an acute angle, shown exaggerated for better clarity, so that there exists still a wedge-shaped gap. After severing the package, the latter is moved into a shrinkage tunnel (not shown) where the plastic film is shrunk to fit tightly against the package over its entire circumference.

In the embodiments shown in Figs. 4 and 5, both the welding bar 10 and the striker bar 13 are displaceable by means of the rods 11 and 22, shown simplified, so that the two bars meet each other approximately at halfway the height of the package.

The cutting device, which is well known is either combined with the striker bar or disposed separately and is controlled in such a way that it becomes operative shortly after the welds are made and after they are cooled. Advantageously, the cutting device according to the invention has at least one additional tool for punching out a grip opening in the carrying strap 23. In the embodiment according to Fig. 6, three grip openings 27, 28 and 29 are provided. For making the grips, three additional tools are arranged in such a way to provide a central grip opening 28 and two edge grip openings 27 and 29, close to the edge of

the carrying strap 23, (see Fig. 6). The grip forming tools have an oval cutting edge so that the grip openings allow easy handling.

As illustrated in Figs. 6 to 8, the carrying strap 23 has weld lines 24 and 25 on opposed sides thereof. For further reinforcement of the grip openings, an additional oval weld 30 can be provided about their circumference. To make this, the welding bar 13 has an additional oval heating zone close to the edge of the respective grip openings 27, 28 or 29. The sections of film inside the grip openings can be punched out completely. But, it is also possible to design the cutting edge of the additional tool in such a way that it only extends over the two curved sections 31 and 32 and an intermediate connecting edge 33 between the two curved sections so that the punched out sections of film can be folded over the other, opposite intermediate connecting edge 34. The folding can also take place over the outer connecting edge 33 with an appropriately reversed tool.

By means of the devices, described above, one obtains a package unit of mineral wool sheets or alternatively also of a roll of mineral wool, which is rolled together from a sheet, with a wrapping 26 that consists of a shrinkable plastic film and of which the ends are joined together by a weld and in which case a carrying strap 23, pointing outwards, is flanged on the weld. For manufacturing reasons, the carrying strap 23, as was described above, is formed from the extended ends of the plastic film sheet, in which case the outer edge of the carrying strap 23 has suitably in addition a further weld 24. The carrying strap 23 has one or several grip openings 27, 28 and 29 which, for reinforcement, are surrounded by the welds 30. In general, it is sufficient to provide just one single grip opening at the centre. If, however, the package units are

particularly large and heavy, the two outer grip openings can be provided instead of the centre grip opening, or in addition to this, so that two persons can handle the package and especially for quick stacking and unloading.

In the case of a square or cubic package unit, the carrying strap can be formed along one of its edges as illustrated in Fig. 3. In the more suitable embodiment, however, the carrying strap 23 is formed according to Fig. 5, disposed in the middle of a wrapped surface.

CLAIMS

1. A device for wrapping a package (14) of mineral wool sheets (15) or rolls, said device having a conveyor (1, 2) for conveying packages, a roll of film (3) spaced above said conveyor and a roll of film (4) spaced below said conveyor (1, 2) a welding bar (10) and a striker bar (13) movable against one another for clamping ends of said films (3, 4) between them and forming a wrapping (26), a cutting device for cutting through a transversely running weld (7) at said ends of said films of said wrapping, said film (3, 4) being pulled from said rolls of film (3, 4) by the moving package, said device being characterized in that said welding bar (10) and said striker bar (13), seen in the direction of conveyance (16) of said package (14), are of a predetermined width and the welding bar (10) is provided with at least two heating zones (18, 19), which are spaced at a distance from one another so that on the periphery of the wrapping (26), a carrying strap (23) is formed.

2. A device according to claim 1, characterized in that said cutting device has at least one additional tool for punching out a grip opening (27, 28, 29) in the carrying strap (23).

3. A device according to claim 2, characterized in that three additional tools are provided so that a central and two end grips opening are provided on said carrying strap (23), said grip openings (28; 27, 29) being be punched out.

4. A device according to claim 2 or 3, characterized in that said additional tool (5) has an essentially oval cutting edge.

5. A device according to claim 4, characterized in that

said cutting edge extends the two curved sections (31, 32) and an intermediate side connecting edge (33), between said two curved sections, so that the punched out sections of film can be folded over an opposite intermediate connecting edge (34).

6. A device according to one of the preceding claims, characterized in that said welding bar (10) has an additional oval heating zone close to the edge of the grip opening (27, 28, 29).

7. A device according to claim 1, 2 or 3 characterized in that the welding bar (10) can be moved down to the striker bar (13) over a travel distance which is greater than the height of said package (14) and that said striker bar (13) is arranged stationary with the striking surface disposed at the level of the conveyor (1, 2).

8. A device according to claim 1, 2 or 3 characterized in that both the welding bar (10) and the striker bar (13) can be moved in such a way that the bars contact one another at approximately halfway the height of the package (14).

9. A package of mineral wool sheets (15) or rolls having a wrapping (26), which consists of a shrinkable plastic film and of which ends of said film are joined together by a weld (7), characterized in that to said weld defines an outwardly extending flange defining a carrying strap (23).

10. A package unit according to claim 9, characterized in that said carrying strap (23) is formed from extended ends of said plastic film.

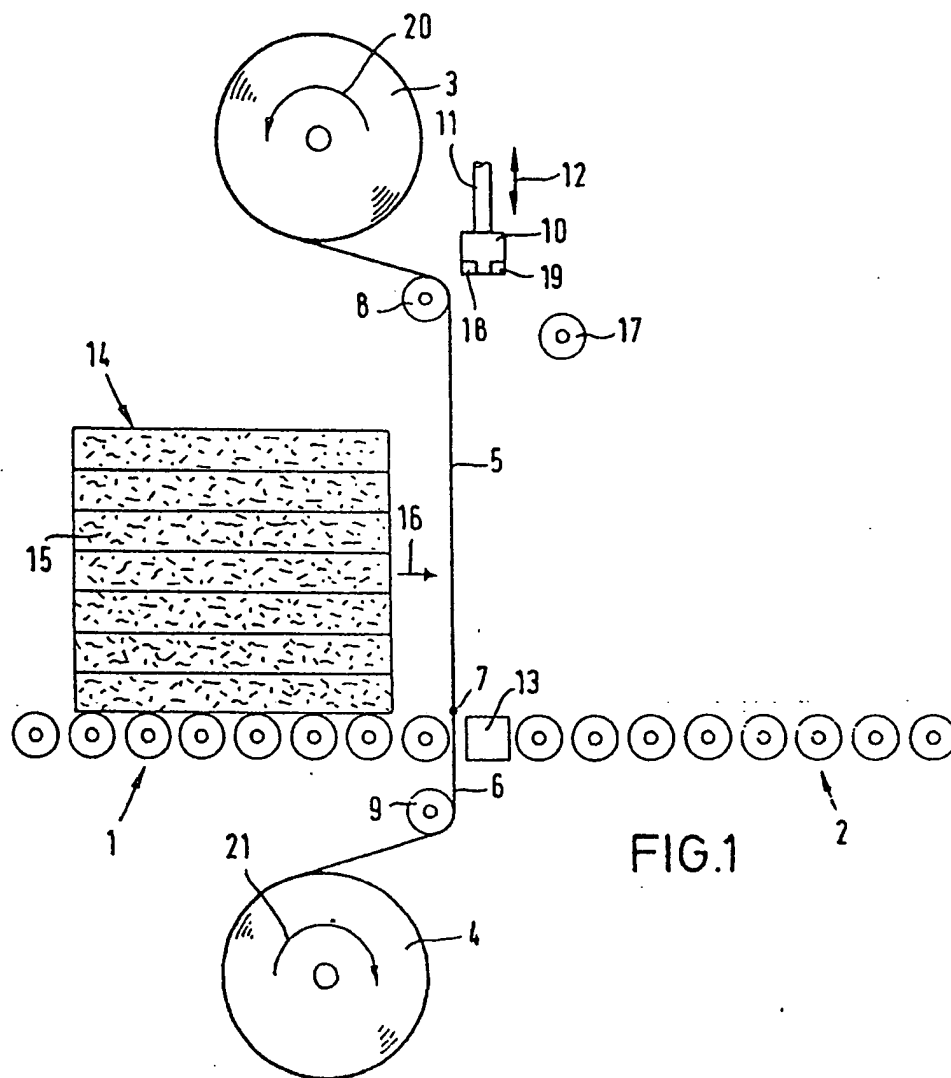
11. A package unit according to claim 10, characterized in that the additional weld (24) is provided at an outer edge of the carrying strap (23).

12. A package according to claim 9, 10 or 11, characterized in that said carrying strap (23) has one or several grip openings (27, 28, 29) which are surrounded by welds(30).

13. A package according to 9, 10 or 11, characterized in that said carrying strap (23) is formed along an edge of said package, said package being square or cubic in shape.

14. A Package according to claim 9, 10 ro 11 characterized in that said carrying strap (23) is formed at approximately mid-length of a wrapped surface when said package is square or cubic in shape.

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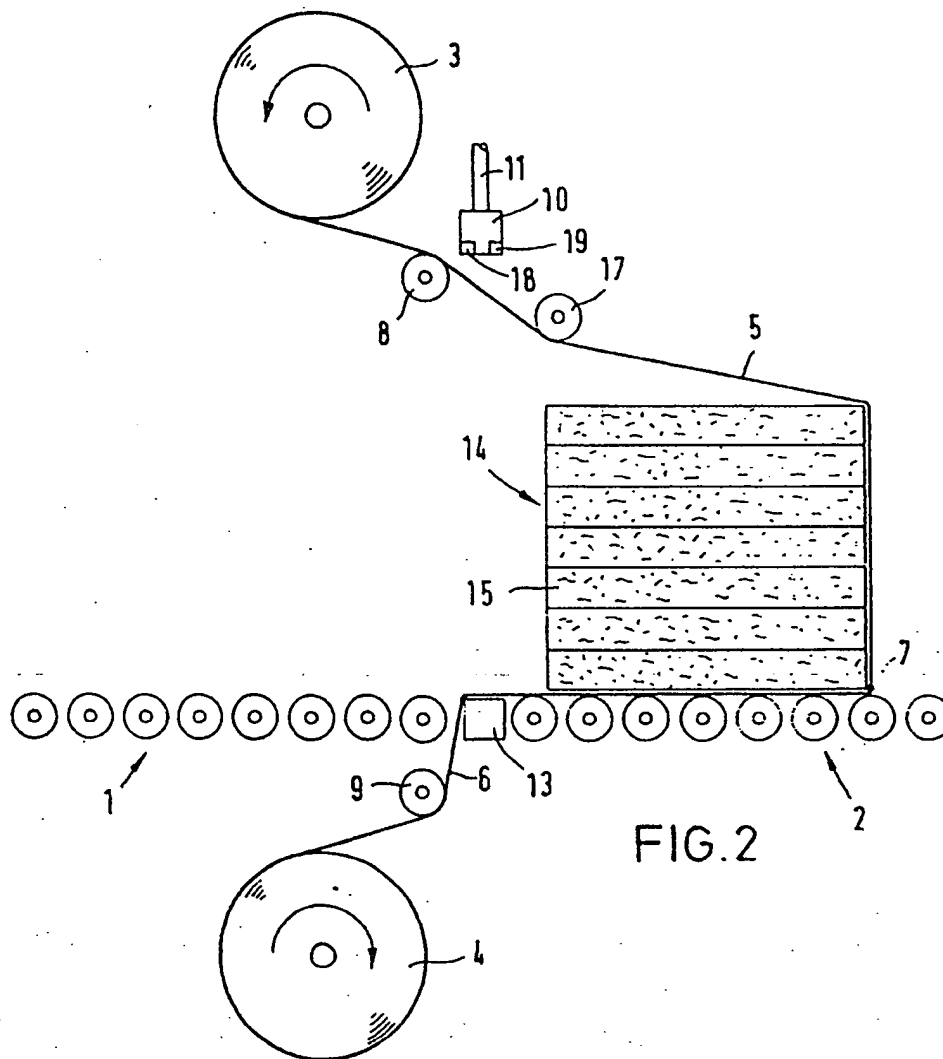
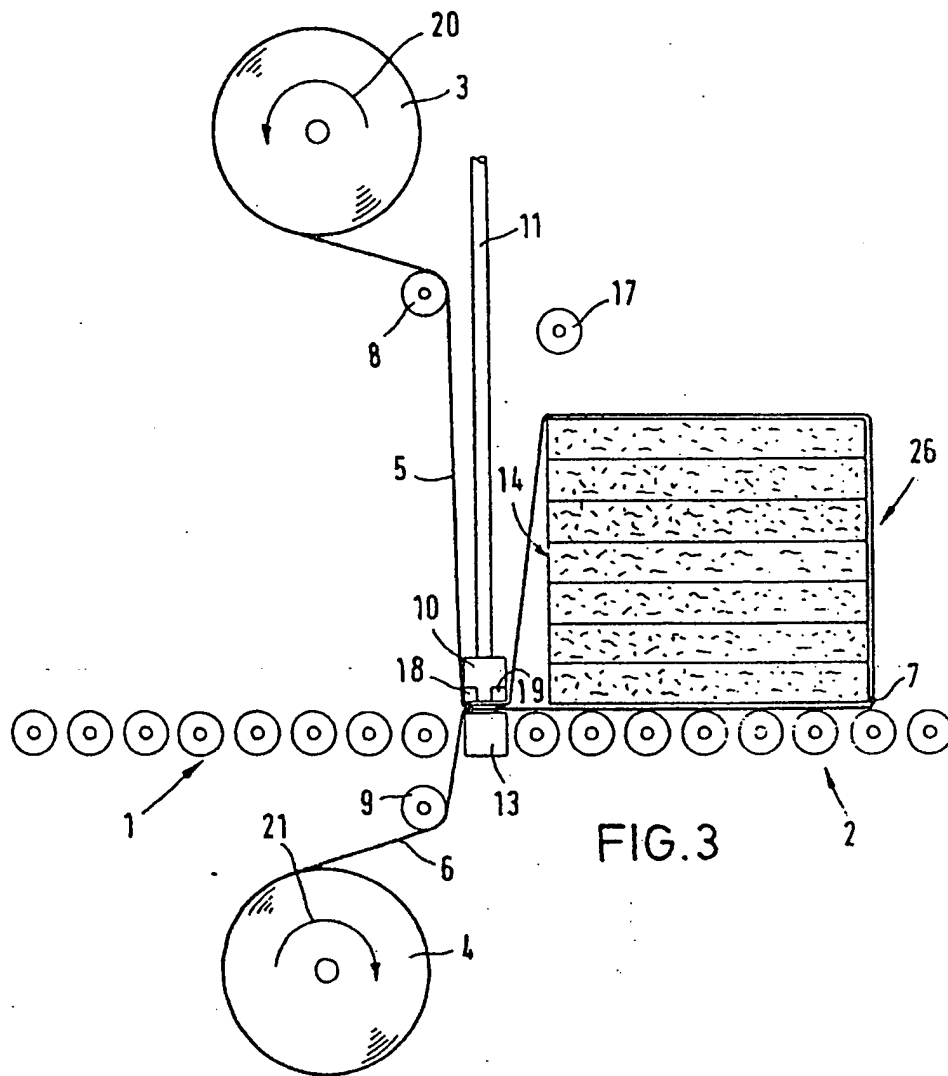


FIG. 2

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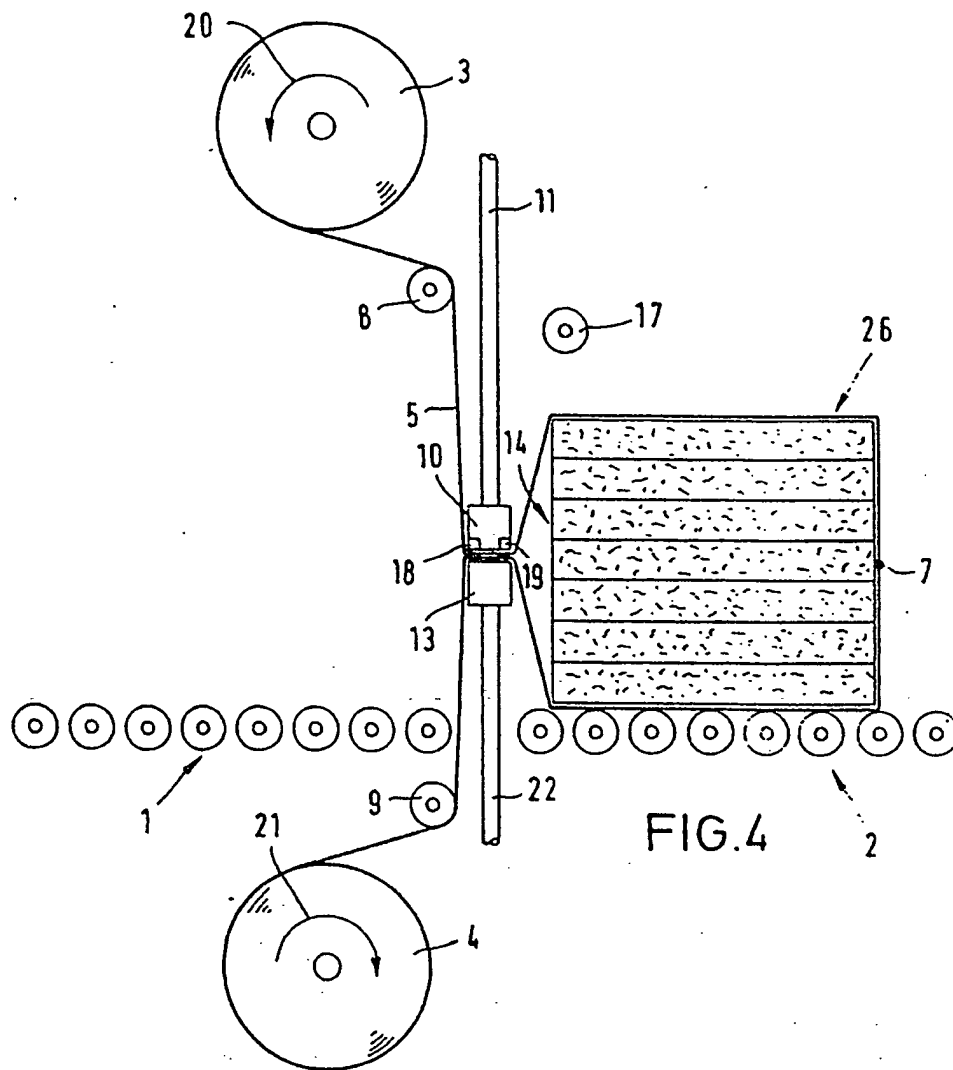


FIG. 4

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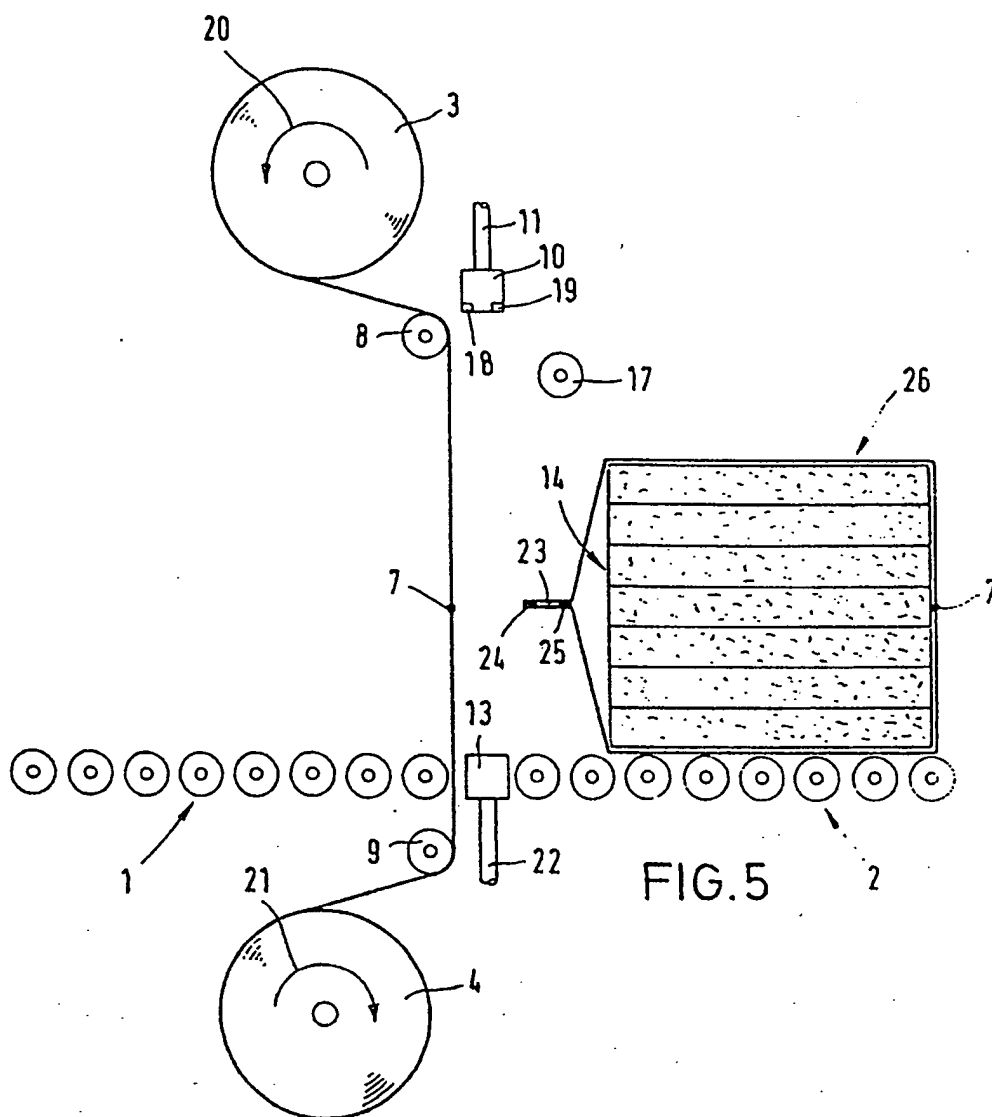


FIG.5

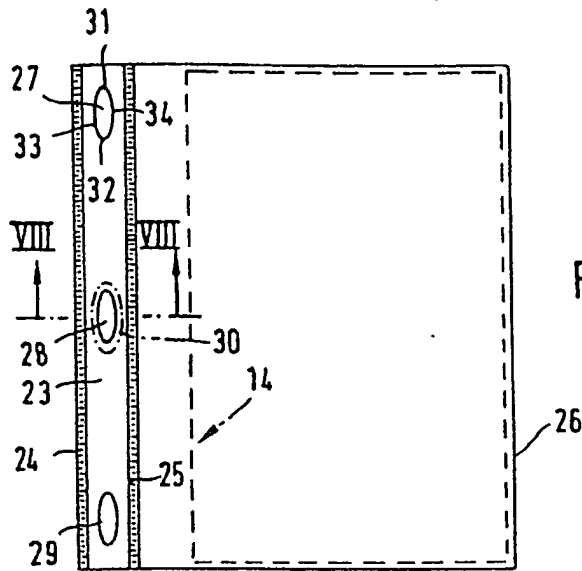


FIG. 6

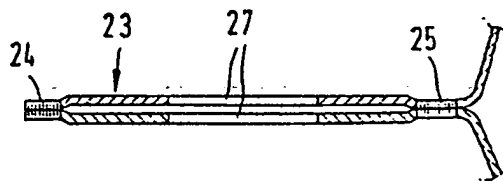


FIG. 7

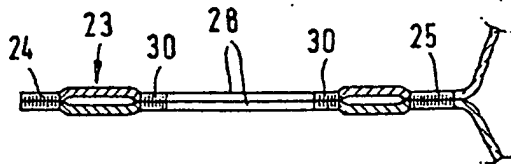


FIG. 8